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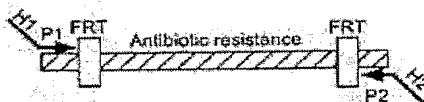
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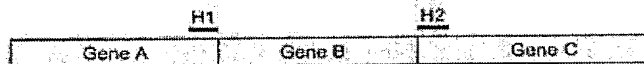
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(54) Title: HYDROGENASE DEFICIENT BACTERIAL STRAINS

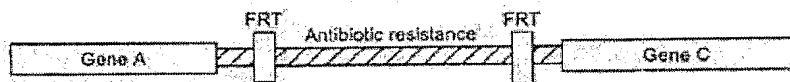
Step 1. PCR amplify FRT-flanked resistance gene



Step 2. Transform strain expressing  $\lambda$  Red recombinase



Step 3. Select antibiotic-resistant transformants



Step 4. Eliminate resistance cassette using a FLP expression plasmid



(57) Abstract: The present disclosure describes pathogenic bacteria that have been modified to be deficient in NiFe hydrogenase activity; compositions comprising such modified bacteria, and the use of such bacteria to protect animals from pathogenic enteric bacterial infections.

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FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,  
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